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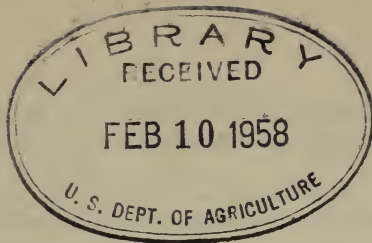
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UNITED STATES DEPARTMENT OF AGRICULTURE,

*2* U. S. BUREAU OF PLANT INDUSTRY //  
*5a* Washington, D. C. //

*3* AGRICULTURAL METHODS FOR BOLL-WEEVIL  
DISTRICTS //

INSTRUCTIONS FOR PRODUCING COTTON UNDER  
BOLL-WEEVIL CONDITIONS.

The outlines of what is known as the cultural system of avoiding injury by the boll weevil are given in Farmers' Bulletin No. 189 of the Department of Agriculture. The following specific recommendations contain the principal points covered in that bulletin, in addition to general recommendations concerning cotton culture which should be followed for the procuring of the best crop regardless of the presence of the pest.

The principal step in fighting the boll weevil, one which should have been taken before this circular was prepared, is the early fall destruction of the stalks in the field. This was described fully in Circular

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*a* A considerable portion of the cooperative cotton demonstration work of the Bureau of Plant Industry is done by personal contact with the farmers themselves. In order to reach a larger number of farmers than is possible by personal visits, however, the accompanying instructions have been prepared. This work is under the charge of Dr. Seaman A. Knapp, with headquarters at Houston, Tex.

No. 56 of the Bureau of Entomology of this Department. The best results can not be expected unless this step has been taken.

In case the farmer did not destroy the cotton stalks early in the autumn of 1904 he should not fail to do so in the fall of 1905. This process reduces by many millions the number of weevils that can pass through the winter successfully, and the destruction of rubbish in and about the cotton fields reduces the number still more.

The following agricultural methods are recommended:

(1) **Flat breaking** (i. e., plowing) the field 1 to 2 inches deeper than usual immediately after destroying the stalks or as soon thereafter as possible.

This operation assists in the preparation of the field for successful cropping during the season.

(2) **The shallow winter cultivation of the soil; that is, working the land with a toothed harrow or a disk once every twenty or thirty days during the winter, as weather may permit, in order to air the soil and destroy grass.**

The soil should be in excellent condition at the time of planting.

(3) **Early planting, the object being to hasten the maturity of the crop.**

The Bureau of Entomology of the Department of Agriculture has shown the great benefit resulting from this practice. The weevils generally do not become numerous enough to destroy the greater portion of the crop that is put on before the last of July.

In addition to the foregoing advantage, early planting has been found generally helpful in combating other cotton pests, such as the boll worm and the leaf worm.

Furthermore, in Texas and Louisiana the winter rains usually leave the soil with plenty of moisture, while in the spring there is likely to be a drought, which may retard germination in the event of late planting.

(4) **The planting of early-maturing varieties of cotton.**

(5) **The application of fertilizers, especially acid phosphate and potash, to hasten the maturity and increase the fruitage, and the use of cotton-seed meal, when necessary, to promote vigor and growth.**

The experiments of the Bureau of Plant Industry have demonstrated that a small amount of fertilizer properly applied accomplishes marvelous results.

(6) **The planting of the cotton so as to leave more space between the rows and greater distances in the row.**

This recommendation is not one that leads to a direct destruction of weevils. Experiments have shown that weevils develop normally in squares placed in the unobstructed rays of the sun. On general principles, however, more space for the plant makes a better stalk, with more limb, more bloom, and a higher grade of cotton. The spacing between the rows and in the rows must depend on the soil and the variety of cotton. More space should be given to fertilized than to unfertilized cotton. At the same time it must not be overlooked that too great spacing actually delays the fruitage of the cotton plants.

(7) **The use of the toothed harrow.**

While harrowing belongs to the general cultivation of the soil, it is of sufficient importance to call for special attention. After early planting the germination is frequently slow and the earth may become crusted. The harrow may be used before the cotton is up for the purpose of breaking the crust, and should be soon afterwards used to keep the soil porous, so that the plants will take on a rapid growth at once.

A crop is sometimes advanced two or three weeks by the judicious use of the harrow.

(8) **Intensive cultivation.**

Deep plowing or cultivation at first, with shallow cultivation at all subsequent times, is an important feature of good cotton production. This practice destroys weeds, increases the plant food, and conserves moisture, consequently hastening plant maturity.

As the work of the Bureau of Plant Industry has progressed, the necessity for the frequent cultivation of the cotton crop and for its continuation as late as possible has been forcibly demonstrated. Where the boll weevil exists the cotton crop should be cultivated every week. Some of the most successful cooperators of the Bureau have cultivated their cotton fifteen times during the season.

(9) **Under some circumstances, picking up the squares that fall.**

This process reduces the rapidity with which the weevil multiplies, but depends directly upon an abundance of cheap labor. It can not, consequently, be considered a general recommendation. Plowing under the squares, or even exposing them to the sun, is not as certain destruction as picking up and burning them.

(10) **Controlling the growth of the plant by barring off or topping.**

Under boll-weevil conditions the main crop must be made upon the lower and middle limbs. There is no advantage in a tall plant. As soon as the plant indicates too rapid growth it should be barred off on each side, thus slightly root-pruning and retarding its upward growth. The tendency will then be to throw more vigor into the limbs and thus cause them to put on more fruit. This method is especially valuable in rich bottom lands, where stalks frequently grow from 6 to 7 feet high. It should be noted that in fields infested with the boll weevil no top crop is made; hence more bottom crop must be secured, requiring a low, vigorous plant with many limbs.

(13) **Selecting the seed.**

Scarcely any item in the cultural system, where early maturity is of primary importance, is more important than the selection of the seed. The largest, best, and earliest bolls from the most vigorous plants should be selected for seed in advance of the general picking and should be kept in a dry place.

(14) **Rotation of crops and the use of legumes.**

Some of the serious difficulties in cotton production arise from the consecutive production of cotton on the same land. This practice reduces fertility and hence operates against early maturity. With the best of efforts in the autumn to clear fields of the weevil by burning the stalks and deep plowing, some weevils will survive and will soon infest a field. By planting one-half the land to corn and cowpeas and the other half to cotton as much cotton can be produced as at present and the land can be gradually restored to its original fertility. The corn and cowpeas will add materially to the income of the farm.

## NOTES ON THE CULTURAL SYSTEM RECOMMENDED.

Fall breaking (plowing) the land one or two inches deeper than usual has an economic value in fitting southern soils for early planting. If some winter cultivation with the harrow is also practiced considerable advantage is secured in giving the soil the best preparation for seeding. The soil retains more moisture and is warmer and more fertile because of this work. Deep plowing, regardless of previous depth, is not advised, because if too much dead soil is brought to the surface at one time it retards the plant growth instead of hastening it. Caution should be observed in fall plowing on hill lands likely to wash. In such situations shallow plowing in the autumn increases the tendency to wash and is generally disapproved, but deep plowing has been found advantageous. In case the land is excessively inclined to wash, the plowing must be done in such a way as to obviate this tendency as much as possible. If it can not be entirely overcome it is better to delay the plowing than to cause the washing of the soil.

It does not fully answer the purpose to burn cotton stalks after they have become dry and the weevils have largely abandoned them. It is of great importance that they be burned while the weevils are still working upon them, and it is preferable to spray them with kerosene oil so that they will burn readily.

It is expected that every farmer will use good judgment as to time of planting. The recommendation to plant as early as practicable is one of general application, and no definite time can be set for different localities, because everything depends upon the season.

The importance of fertilizers to promote the growth of the plant and to hasten maturity is well understood. A judicious use of acid phosphate with a small percentage of potash increases fruitage and hastens the maturity of the plant. In purchasing acid phosphate it is best to obtain 14-per-cent phosphate if possible. Generally, some nitrogenous fertilizer, to promote growth and thus aid in securing a more vigorous plant, should be added, and this is true even on rich land. To the cotton planter this means the use of some cotton-seed meal. Usually a small quantity of this mixed fertilizer will produce marvelous results. In some cases the use, in connection with intensive cultivation, of 200

pounds to the acre of cotton-seed meal and acid phosphate with 2 per cent of potash produced a crop fivefold greater than the ordinary yield.

Unless the land is considerably worn, it is advisable not to use too large a quantity of fertilizer, and the fertilizer should always be adapted to the soil. For hilly and worn-out lands generally, a mixture of 100 pounds of acid phosphate with 2 per cent of potash and 100 pounds of cotton-seed meal has been found to contain the necessary ingredients suited to such soils. On very rich bottom land or prairie land one-fifth of this quantity of cotton-seed meal will answer the purpose. On lands in fairly good condition 200 pounds of this mixture per acre will give good results. If the land is considerably worn an application of 400 pounds per acre is advised. In all cases the fertilizer should be distributed in the rows and well mixed with the soil by means of a small cultivator at least two weeks before the cotton is planted. If it is difficult to obtain the acid phosphate with potash and the cotton-seed meal in separate form, a fertilizer containing 6 or 7 per cent of phosphoric acid, 2 per cent of potash, and 6 or 7 per cent of nitrogen will answer the requirements for lands somewhat worn.

## FARM MANAGEMENT OF CORN AND COWPEAS IN THE SOUTH.

It has long been recognized that corn and cowpeas are two of the most valuable food crops for stock that are in general use by southern farmers. Their hardy character, vigorous growth, and wide adaptation to climates and soils place them in the first rank among plants for general farm use. In the improved system of agriculture which the South must adopt to meet boll-weevil conditions corn and cowpeas must occupy a more important position than at any previous period, because soil conditions must be improved in order to make good cotton crops, and this can best be accomplished by the alternate planting of corn and cowpeas and of cotton.

### CORN.

The soil should be prepared for the corn crop the same as for cotton by deeper fall plowing (or breaking) of the land and by winter cultiva-



tion. The corn should be planted as early as the season will permit, in rows 6 feet apart on rich land and 5 feet apart on hill lands and worn bench, bottom, or prairie lands.

### SEED CORN.

In the selection of seed corn, better results in bushels will be reached by securing promising varieties grown not more than 200 miles north of the field to be planted.

The ears should be of medium length, with kernels deep and firm, well filled at the ends, and with small cobs. Above all, seed corn should be specially selected and carefully housed, and not taken at random from a crib.

In planting, the irregular kernels at the end of the cob should be rejected and plenty of seed should be used.

### FERTILIZERS.

On light soils and uplands that have been considerably worn 400 pounds per acre of a fertilizer compounded as follows should be used and thoroughly mixed: One hundred and sixty pounds of 14-per-cent acid phosphate containing 2 per cent of potash, and 240 pounds of cotton-seed meal. This should be distributed in the rows where the corn is to be planted from two to three weeks before planting and should be followed with the cultivator to mix the fertilizer with the soil. On rich prairie or bottom lands 100 pounds of cotton-seed meal to 300 pounds of phosphoric acid and potash should be mixed, and only 200 pounds of the mixture should be used for each acre. In general, the proportion of cotton-seed meal used in the mixture and the total amount of fertilizer applied per acre should be reduced as the fertility of the soil increases.

### CULTIVATION.

As soon as the corn is up the tooth harrow should be used and the land cultivated once every ten days until the corn is too large to permit further cultivation. The first cultivation may be deep; all later culti-

vations should be shallow. Many use only the plow in cultivation. It is not the best implement, for the two-horse cultivator does better and more rapid work. The corn in the rows should be thinned to a stand of one stalk every 12 inches on poor lands and every fifteen inches on very rich lands. The greater the width of the rows the closer the stalks may be allowed to stand in the row.

### COWPEAS.

At the time of the last working of the corn four rows of cowpeas should be planted in each space between the corn rows, using about two bushels of peas per acre. In case the land is poor it will be well to use 100 pounds of cotton-seed meal per acre at the time of planting the cowpeas. This will help the corn and insure a crop of peas.

### COST OF THE CROPS.

It may be urged that too much expense is put upon the corn crop by the method here recommended. The cost of fertilizer is placed at \$5.50 per acre, the additional work upon the land at \$2, and the cowpeas at \$3, making a total of \$10.50 per acre. The return should be and will be under average conditions an increase of 40 bushels of corn per acre, worth \$20, and at least 1 ton of cowpeas, worth \$12; total, \$32. Nor is this all. The effect of good cultivation and of the cowpeas on the cotton crop to follow the next year should be equal to a quarter of a bale of cotton, worth \$10, which, added to the \$32, gives a total return of \$42 for an expenditure of \$10.50 in labor and fertilizer.

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Approved:

B. T. GALLOWAY,  
*Chief of Bureau.*

WASHINGTON, D. C., *February 21, 1905.*

